



Korea Fair Trade Commission

Wednesday, December 28, 2016

Anti-Monopoly Bureau

Tel: +82-44-200-4484
+82-44-200-4740

KFTC imposes sanctions against Qualcomm's abuse of SEPs of mobile communications

- imposes 1.03 trillion won, the highest penalty surcharge ever handed to an individual company by the KFTC and remedies on unfair business model –

<Summary>

- The Korea Fair Trade Commission (headed by Chairman Jeong Jae-chan, hereinafter referred to as the “KFTC”) has decided in the plenary session held on Wednesday, Dec.21.2016 to impose remedies along with a penalty surcharge amounts to 1.03 trillion won on Qualcomm Incorporated, QI* and its two affiliated companies** (hereinafter collectively “Qualcomm”), which is a global modem chipset maker and patent-licensing operator for the abuse of market dominance.

* QI is the U.S. headquarters of Qualcomm and operating a patent licensing business

** Qualcomm Technologies Inc. (QTI) and Qualcomm CDMA Technologies Asia-Pacific PTE LTD (QCTAP) are doing modem chipset business for mobile communications.

- Qualcomm is a SEP holder that declared the FRAND commitment* to SSOs such as ITU and ETSI regarding mobile communications standard technology such as CDMA, WCDMA and LTE. Qualcomm is also vertically integrated monopolistic company that manufactures and sells modem chipsets. It has engaged in the following conducts in violation of the FRAND commitment.

*FRAND commitment refers to a promise that SEP holders will license to the patent users in a fair, reasonable and non-discriminatory manner.

- ① Notwithstanding requests from rival modem chipset makers, Qualcomm refused or restricted the licensing of mobile communications SEPs (Standard Essential Patents) that are essential in manufacturing and selling the chipsets in market.

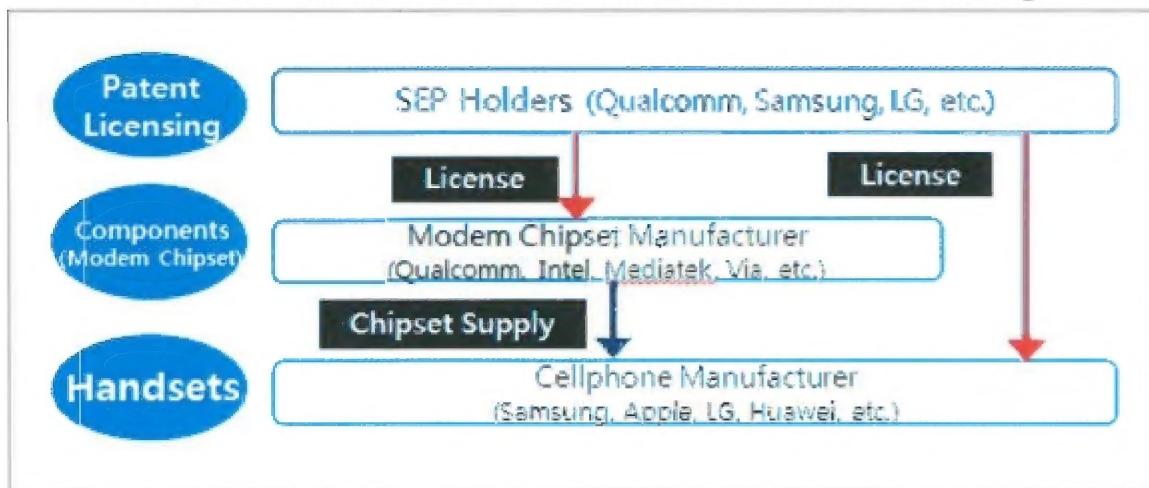
- ② Qualcomm coerced handset makers to sign unfair license agreements by linking the chipset supply with patent license agreements, using its market position as a leveraging tool in its negotiations and circumventing the FRAND commitment.
- ③ Qualcomm only offered the comprehensive portfolio license to handset makers and forced unilaterally-decided licensing terms without undergoing a reasonable value assessment process. Also, it coerced handset makers to accept unfair agreements such as making them license their patents for free.
- After completing the investigation on the illegal conduct described above, the KFTC sent an examination report to Qualcomm on Nov. 13 last year, and held a total of seven hearings including the two regarding the consent decree and conducted an in-depth review of the case since this July.
 - Moreover, the KFTC reviewed the case from various angles by inviting not only Korean companies such as Samsung and LG but also other global ICT companies including Apple (US), Intel (US), Nvidia (US), MediaTek (Taiwan), Huawei (China) and Ericsson (Sweden) to the hearings.
 - This case is meaningful in that the KFTC is the first to impose corrective measures on Qualcomm's unfair business model that has been coercing unilateral licensing terms to mobile phone manufacturers, while refusing to license to competitors in order to strengthen its monopoly power in the patent license market and chipset market.
 - In particular, the measures are designed to turn 'an exclusionary ecosystem that allows Qualcomm to be an exclusive beneficiary' into 'an open ecosystem where any industry player can enjoy the incentives of innovation that it has achieved'. It is expected that this imposing of measures serve as the trigger to restore the fair competition in the mobile communications industry.

I. Market Structure and Current status

1. Market Structure

- The mobile communications industry consists of patent license market, component market such as modem chipset, handset market and mobile communications service market.
- Qualcomm is a vertically integrated monopolistic enterprise that engages in patent licensing and modem chipset businesses, which are upstream markets in the overall market structure.

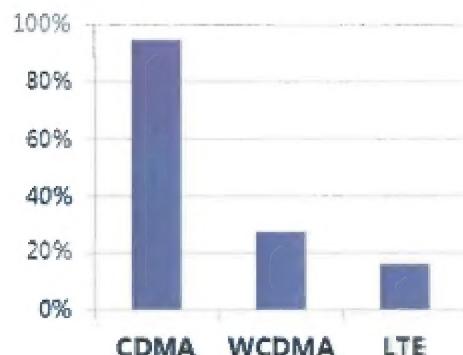
<Overview of the Market Structure of the Mobile Communications Industry >



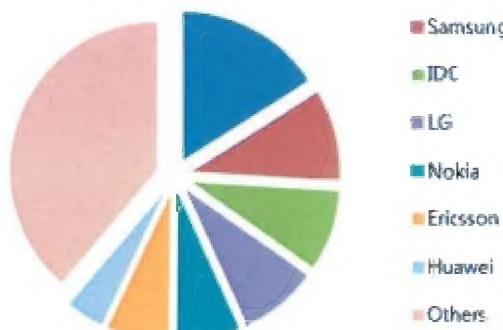
2. Relevant Markets and Market Dominance

- **(Mobile communications SEP license market)** Qualcomm owns the largest number of SEPs over the mobile communications generations of 2G (CDMA), 3G (WCDMA) and 4G (LTE).
- Since SEP is irreplaceable with other technologies, a SEP holder with even just one SEP will gain a complete monopoly power.
- ※ Unlike CDMA, most of which had been possessed by Qualcomm, the share of Qualcomm in the WCDMA and LTE dramatically decreased to 27% and 16% respectively.

Qualcomm's Patent Shares per Mobile Communication Standard



Each Company's Shares of LTE SEPs



* Based on public data from the ETSI website in 2015

- **(Modem Chipset market)** Qualcomm holds its monopolistic position in the CDMA modem chipset market, and also has long maintained its market dominance in the WCDMA and LTE markets.
- Even today with the spread of LTE technology, Qualcomm still exclusively supplies multimode CDMA-LTE chipsets that are backward compatible with CDMA.
- * Backward Compatibility: Evolution of mobile communications does not necessarily mean a simultaneous change in communications standards because there are still users of handsets with old standards, and it takes a considerable time to replace base stations. Therefore, modem chipsets and mobile phones have to support not only new standards but also the old standards.
- Moreover, Qualcomm holds an unrivaled position for the high-end premium products.

<Qualcomm's Market Share Trend in Modem Chipset Market per standard>

(※ Based on revenues)

	2008	2009	2010	2011	2012	2013	2014	2015
LTE	-	-	34.2%	58.8%	94.5%	96.0%	84.8%	69.4%
CDMA	98.4%	97.6%	96.4%	94.3%	92.4%	93.1%	91.6%	83.1%
WCDMA	38.8%	47.4%	45.7%	55.0%	50.4%	53.9%	48.8%	32.3%

* Source: Strategy Analytics

3. Current Status of Qualcomm's Revenues

- Qualcomm's annual global modem chipset turnover and patent royalty revenue amount to 25.1 billion USD. (As of 2015)

< Qualcomm's global revenues (Million USD) >

	2013	2014	2015
Patent Royalty (QTL)	7,554	7,569	7,947
Modem Chipset turnover (QCT)	16,715	18,665	17,154
Total	24,269	26,234	25,101

*Based on Qualcomm's 10-K for 2015

- The turnover derived from the Korean market slightly differs from year to year, but is approximately 20% of the total global turnover.

* The proportion of the Korean market per year (2013: 20%, 2014: 23%, 2015: 16%)

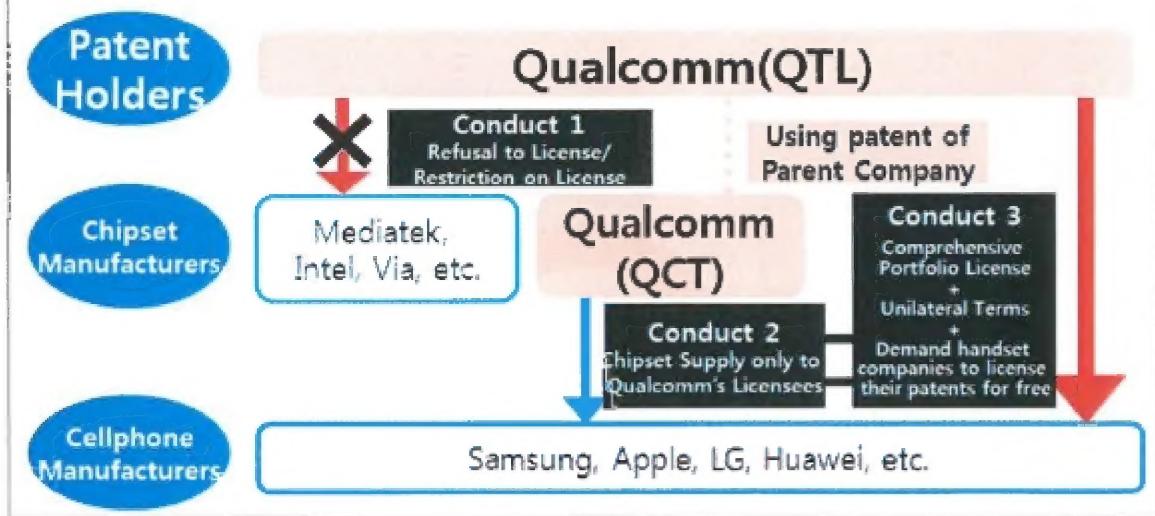
II. Facts of Violation

- **(Overview of Qualcomm's Business Model)** As a monopolistic enterprise in mobile communications SEP market and modem chipset market, Qualcomm has established a business model that skips the chipset level and licenses at the handset level.
- To do so, Qualcomm has ① refused or restricted to license SEPs to rival chipset makers; ② by linking chipset supply with patent license agreements, coerced the signing and executing of unfair license agreements by using its chipset supply as leverage and circumventing FRAND commitment; then ③ forced unilaterally-decided licensing terms without a fair compensation calculating process while only providing portfolio licenses, and demanded the handset makers to cross-license their patents for free.

< Overview of Qualcomm's Business Structure >

□ Qualcomm is separately operating its license business (QTL) and modem chipset business (QCT).

- (1) QTL does not provide licenses to any chipset companies.
- (1) QCT demands handset makers to sign and execute license agreements with QTL while selling modem chipsets to them. In other words, Qualcomm is linking its businesses even after it divided the corporate entities.
- (2) As a result, QTL was able to easily coerce handset makers to sign unilateral license agreements, and allow QCT and modem chipset customers of QCT to use the licenses for free after getting the cross-licenses for patents of chipset makers.



1. Refusal/Restriction of mobile communications SEP licenses to rival chipset makers

- Qualcomm declared the FRAND commitment to international SSOs such as ITU and ETSI so that Qualcomm's mobile communications technologies could be adopted as the industry standard.
- However, Qualcomm violated the FRAND commitment and refused or restricted to license mobile communications SEPs that are essential in manufacturing and selling chipsets despite the request by the chipset manufacturers.
 - Companies including Samsung, Intel and VIA requested to sign license agreements for mobile communications SEPs, but Qualcomm refused*.

* Qualcomm concluded that it would be difficult to maintain a model that receives royalties from handset makers if it provides licenses to competing chipset companies.

- Rival chipset makers such as MediaTek requested complete patent license agreements, but Qualcomm entered into an incomplete agreement* that restricts the rights subject to the license.

* Main examples include restricting the rival chipset makers the rights to sell and the rights to use modem chipsets. Also, Qualcomm demanded them to report sensitive sales information such as sales amount by product model, product model and names of customers of rival chipset companies.

2. Coercion of patent license agreements holding chipset supply as hostage

- Qualcomm established and strictly executed the business policy that does not supply modem chipsets to handset makers not licensed by Qualcomm.
- Reflecting such business policy onto the modem chipset supply agreements, Qualcomm prescribed that Qualcomm could refuse or cease the supply of chipsets whenever a handset maker does not sign or execute the license agreements.
- Qualcomm actually used the threat of terminating the supply of modem chipsets as a negotiating leverage in the process of license negotiations with handset companies.

3. Portfolio licensing all of Qualcomm's patents, coercing unilateral licensing terms without a fair compensation calculating process, and demanding free cross-licenses to handset makers.

- Without distinguishing between mobile communications SEPs practiced by the chipsets and other patents, or distinguishing by mobile communications standards such as 2G/3G/4G, Qualcomm only provided portfolio licenses of all of Qualcomm's patents at once. (*Comprehensive portfolio license*)
- Without giving handset makers opportunities to properly evaluate the value of Qualcomm's patents, Qualcomm coerced unilaterally-decided licensing terms to them. (*Unilateral licensing terms*)
- Without providing fair compensations for patents possessed by handset companies while licensing its patents to about 200 handset makers, Qualcomm demanded them to cross-license. (*Royalty-free cross-grant*)

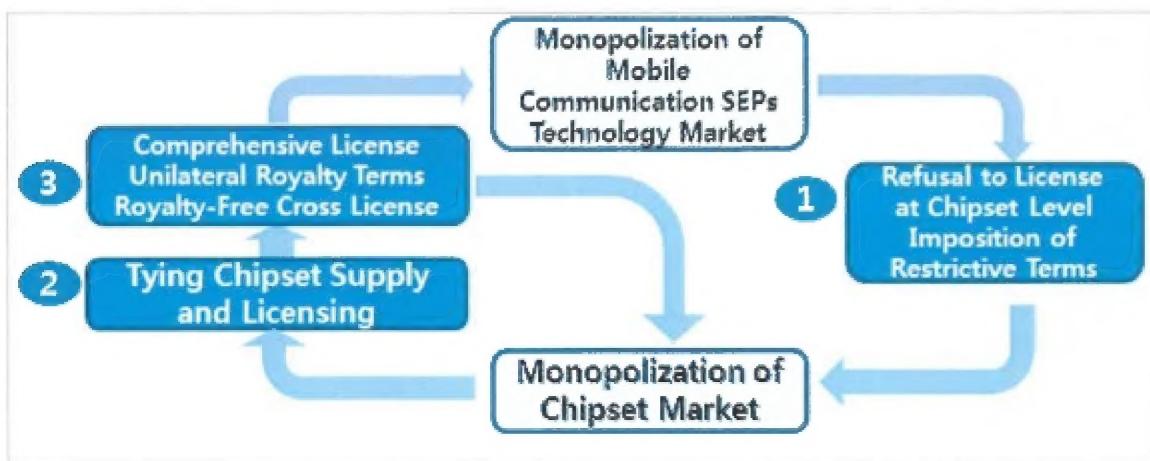
<Structure of Cross-license Between Qualcomm and Handset Companies >



4. Completion of an unfair business model by organically combining each conduct

- The three above described conducts organically combine together to form Qualcomm's anti-competitive business model.
- Monopolize the chipset market by refusing or restricting the provision of licenses to competing chipset makers that leads to the nurturing of unfavorable conditions to rivals, and
- Increase Qualcomm's negotiating power in the license market by evading the restrictions of FRAND through taking advantage of its dominance in the chipset market that it would restrict the chipset supply if handset companies do not sign or execute the license agreements.
- With such reinforced power, Qualcomm has enforced various disadvantageous terms against handset manufacturers. For example, Qualcomm compelled handset manufacturers to accept unilaterally-determined license terms and required them to grant cross-licenses for free.
- Qualcomm, thanks to such unfavorable terms (i.e., patent umbrella), successfully put itself in a more advantageous position over rival chipset manufacturers. The ramification was the creation of a circular structure where Qualcomm was able to maintain and reinforce its dominant position in both the chipset market and the patent licensing market.

<Structure of Qualcomm's Organic Feedback Business Model>



III. Anticompetitive effects in relevant markets

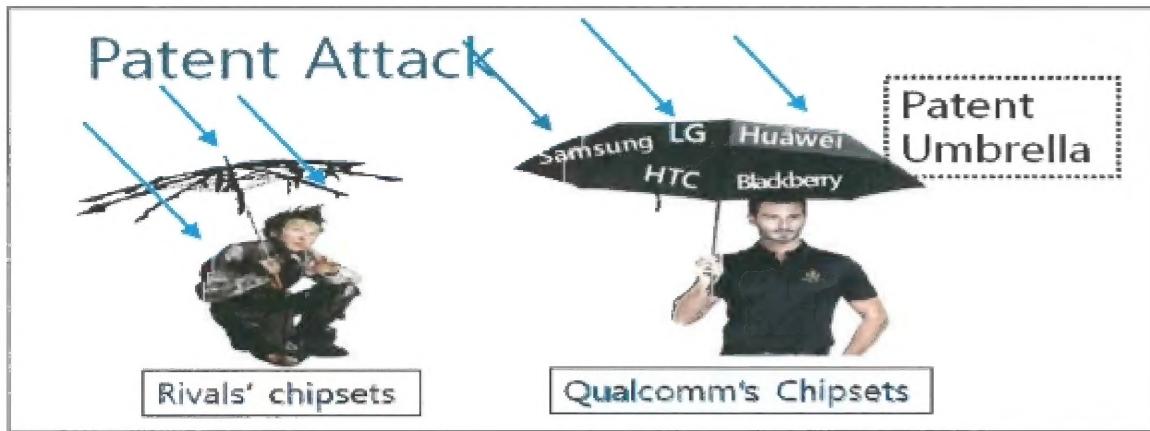
- Qualcomm's unlawful conducts caused anti-competitive effects in the modem chipset and mobile communications SEP license markets, and in turn, those hindered the R&D activities of other enterprises which restricted R&D competition for mobile communications technologies.

1. Modem chipset market

- Qualcomm has maintained a self-contradictory position in which it receives licenses from other patent holders including handset makers while it does not grant any license to its competitors. ("Double Standard")
- Accordingly, Qualcomm chipsets could become safe from patent infringement attacks, while competitors' chipsets became vulnerable. This resulted in a substantially favorable competitive landscape for Qualcomm in the chipset market. ("Unlevel playing field")
- The "free cross-grants" that Qualcomm acquired from handset companies and others provide the "patent umbrella" which offers protection from patent infringement attacks only to Qualcomm's chipset customers. As a result, this allows Qualcomm to easily gain a competitive advantage.
- When a handset maker purchases chipsets from Qualcomm, it is exempt from royalties for patents of other patent holders that it would have to pay if it hadn't been a Qualcomm customer, thereby enjoying the protection offered by the patent umbrella.

- * Qualcomm has been advertising to handset manufacturers that its customers would gain a benefit of huge savings in IP costs if they choose Qualcomm's chipsets instead of its rivals' chipsets (since 2004, approximately 240 white paper advertisements)
- On the other hand, if a handset maker buys chipsets from Qualcomm's competitors, it would have to pay for additional royalties for other handset makers' patents, making rival chipset manufacturers unable to compete on the merits.

<Competitor Exclusion Effect of Free Cross-grants (Patent Umbrella)>

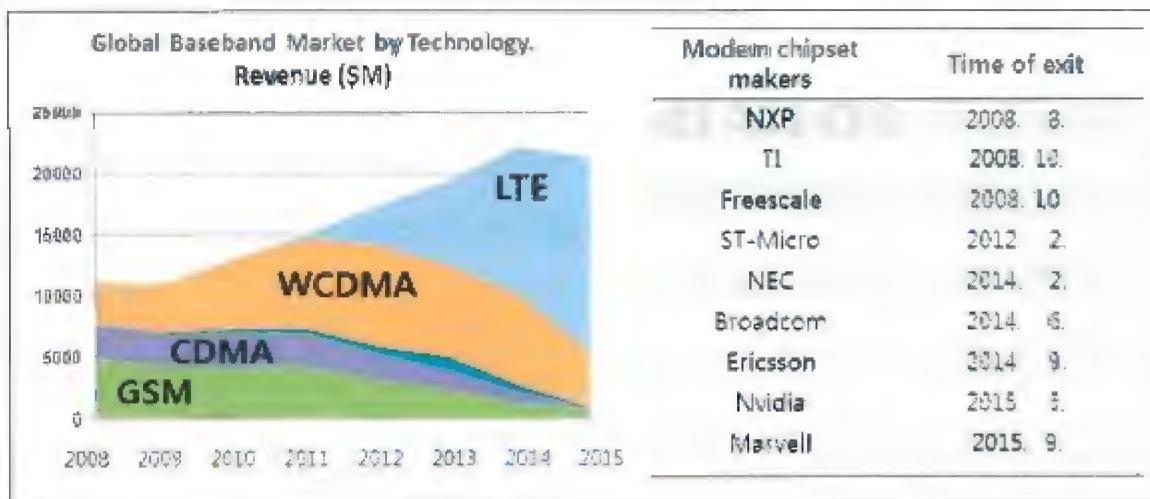


- Qualcomm's practice of refusing to license to competing chipset companies has limited the competitors' customers and has created a structure in which Qualcomm can intervene in the transactions between the competitors and their respective customers.
- Under the structure, competing chipset makers are subject to patent infringement attacks when they sell their chipsets to handset makers that have not entered in license agreements or that have disputes with Qualcomm.
- This makes it difficult for the competing chipset makers from actively exploring markets as they can sell their products only to handset makers that have signed a license agreement with Qualcomm.
- In addition, Qualcomm has made it possible for itself to unfairly intervene in the transactions between its competitors and handset companies by taking advantage of the fact that the handset companies have no choice but to execute and perform patent license agreements with itself.
- When a handset company attempts to purchase chipsets from Qualcomm's competitors, Qualcomm can interfere with the competitors' chipset sales by,

for example, conducting strict royalty audits on the handset company.

- Qualcomm can attract competitors' customers by, for example, providing conditional rebates to those handset companies that purchase chipsets from Qualcomm.
- Anticompetitive effects in the modem chipset market are identified through several indexes.
 - ① Major competing chipset makers' market exit and restricted new market entry
 - Among the 11 major chipset companies selected by Deutsche Bank in 2008, 9 companies have exited the market.
 - * EONEX, the only small and medium-sized modem chipset maker based in Korea, also exited the market in 2009
 - Although the size of the entire modem chipset market has grown by more than twice the market size in 2008, due to Qualcomm's refusal to license and other practices, no significant competitor has newly entered the market.

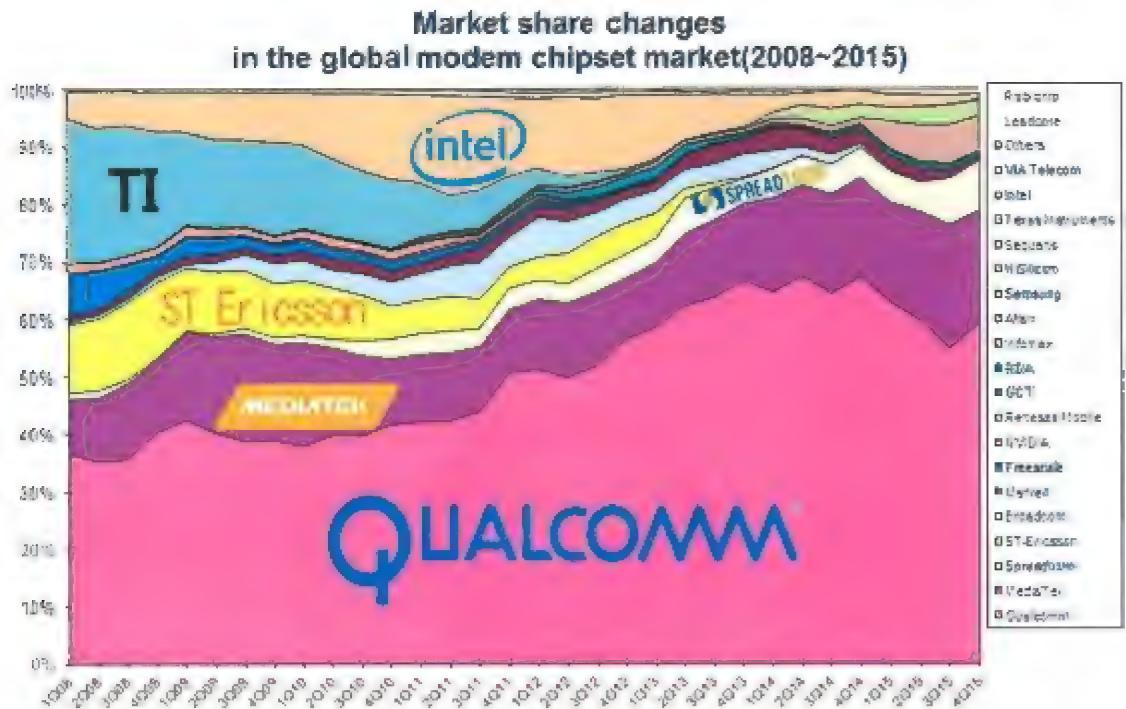
<Growth Trend for Modem Chipset Market and Major Chipset Makers' Market Exit Status>



- ② Qualcomm's market share and market concentration in the modem chipset market have steadily increased.
 - Whereas the technology market has been evolving from CDMA technology to 4th generation LTE and the influence of CDMA has been decreased,

Qualcomm's market share in the entire chipset market has continued to be on the rise.

- The Herfindahl-Hirschman Index (HHI), a measure of market concentration, increased greatly from 2,224 in 2008 to 4,670 in 2014.



2. Mobile communications SEP license market

- The process of setting a standard artificially grants monopoly power to the chosen standards by selecting specific technologies as standards and excluding competing technologies through the agreements reached by enterprises on the basis of the FRAND commitment.
- The FRAND commitment is SEP holders' promise to license their technologies to anybody on fair, reasonable, and non-discriminatory terms in order to prohibit SEP holders' abuse of monopoly power.
- To this end, if SEP holders do not comply with the FRAND commitment, standard technologies, which belong to a few companies, would harm the standard setting process and would suppress competition in the technology market.
- The FRAND commitment, which is designed to prevent the abuse of dominance granted to SEP holders, has become ineffective because

Qualcomm has been compelling its patent licensing agreement as a condition of purchase of its chipsets. (The FRAND commitment is rendered meaningless)

- As handset makers that have no choice but to use Qualcomm chipsets have to acquiesce to Qualcomm's demands, they cannot negotiate SEP license terms on an equal footing.
- Handset manufacturers would confront with the significant risk of suspension of business operation unless they secure a continued supply of modem chipsets. Thus, handset manufacturers had to consent to Qualcomm's unfair terms.
- Major competition authorities view the act of seeking an injunction in courts based on a patent infringement claim against willing licensees itself as a violation of competition laws.

* US FTC's Google-Motorola Mobility Case (2013), European Union's Samsung, Motorola Mobility Case (2014) and more.

- However, under Qualcomm's structure, even without going through the process of a private lawsuit in courts, Qualcomm uses the means to immediately suspend handset companies' businesses as negotiation leverage at its own discretion.

<Comparison and Contrast between Injunction and Refusing and Suspending the Supply of Chipset>

Category	Injunction	Refusing and Suspending the Supply of Chipset
Decision-maker	Neutral entities such as courts	Qualcomm
Decision standard	Relevant laws and contractual terms	Qualcomm's subjective decision
Time to be effective	Effective after the final decision is made	Immediately effective
Scope of influence	Within jurisdiction	Entire scope of business

- Unfair patent license agreements that actually violate the FRAND commitment have been executed. (Patent Holdup)
- As Qualcomm provides only comprehensive portfolio licenses for its SEPs and non-SEPs, even handset companies that wish to use only mobile communications SEPs unavoidably have to receive license to other unnecessary patents from Qualcomm.

- Qualcomm has not changed its royalty rate by taking advantage of a coercive package licensing for a long or indefinite term even though the contribution of Qualcomm's technologies has lessened substantially as mobile telecommunications technologies have evolved from 2G to 3G to 4G constantly.
- Without the proper assessment of the value of the patents belonging to handset manufacturers, Qualcomm has been allowing the purchasers of its chipsets as well as itself to utilize handset manufacturers' technologies for free.

3. Distortion of R&D Innovation Competition

- Handset manufacturers have lost an incentive to make R&D investments as Qualcomm forced handset manufacturers to cross-license at no charge.
- Handset manufacturers would not be paid a fair compensation due to the forced free cross-licensing to Qualcomm even if they became the holders of multiple SEPs through vigorous and continued R&D investments.
- Handset and modem chipset manufacturers have been discouraged to develop new technologies because Qualcomm has applied the royalty rate determined unilaterally by itself, without giving a proper consideration to the value of the licensed patents.
- Today, a smartphone is an IT device which is made by integrating various technologies developed by handset manufacturers, parts manufacturers (including modem chipset manufacturers), and software (application) developers.
 - Under the existing Qualcomm's contractual scheme, Qualcomm takes away a considerable portion of the rewards from any market participants' R&D efforts, which create new demand and value added.

IV. Applicable Laws and Remedies

1. Applicable Law

- Abuse of market dominant position and unfair trade practices (Both are applicable)
- The Monopoly Regulation and Fair Trade Act Article 3-2 (1) 3, Enforcement Decree of the Monopoly Regulation and Fair Trade Act Article 5 (3) (Abuse of Market Dominance: Unreasonably interfering with the business activities of other enterprises)

- The Monopoly Regulation and Fair Trade Act Article 23 (1) 4, Enforcement Decree of the Monopoly Regulation and Fair Trade Act Article 36 (1) (Unfair Trade Practices: Abuse of Superior Trading Position)

2. Remedies imposed

<Key remedies>

- ① When requested by modem chipset makers, Qualcomm shall engage in good-faith negotiations for patent license agreements. In cases of entering into a license agreement with a modem chipset maker, Qualcomm is prohibited from imposing unfairly restrictive terms such as restrictions on the scope of purchasers of the chipsets and restrictions on the right to use chipsets.

<Negotiation Procedure>

- When requested by modem chipset makers to enter into a license agreement for mobile communications SEPs, Qualcomm shall send a draft for license agreement including the royalty calculation method, etc., to the chipset companies.
- Under the common industry practices and good faith, the parties sufficiently negotiate for a period, the length of which is agreed upon by the parties, and draft the final license agreement.
- If the parties do not reach an agreement regarding the execution of the agreement, the parties shall request an independent third party to make a determination and follow such determination.

- ② Qualcomm shall not coerce the execution of patent license agreements by using the modem chipset supply as a leverage, and shall amend or delete relevant provisions in agreements.

* However, an exception applies to handset companies that are clearly confirmed to be unwilling licensees that, for instance, refuse to engage in good-faith negotiations for license terms.

- ③ Qualcomm shall be prohibited from coercing unfair contractual conditions* for patent license agreements with handset makers and when requested by handset makers, Qualcomm shall engage in a renegotiation on the existing patent licensing terms.

* For example, a term regarding comprehensive portfolio licensing without any distinction between SEPs and non-SEPs, or standards per generation and a term unilaterally demanding cross-licenses without conducting a procedure calculating fair compensation

- ④ Qualcomm shall notify handset and chipset makers of the fact that it is

ordered to comply with remedies and report to the KFTC if Qualcomm newly executes or amends agreements or deletes provisions in accordance with the remedies.

<Scope of remedies' application>

- The remedies above apply to Qualcomm's transactions with the following entities, which have an impact on the Korean market, considering the effectiveness of the remedies, the principle of proportionality, and international comity.

Handset makers	(1) Handset makers that are headquartered in Korea, (2) Handset makers and sellers that sell handsets in Korea, (3) Enterprises that supply handsets to an enterprise that sells handsets in Korea
Modem chipset makers	(A) Modem chipset makers that are headquartered in Korea, (B) Enterprises that supply modem chipsets to handset makers that fall under (1) or (3) above

- * Qualcomm may request the KFTC to review the remedies in case foreign competition authorities or courts render a conflicting decision that would make it impossible for Qualcomm to concurrently comply with KFTC's remedies and those decisions.

<Penalty surcharges>

- A total of 1.03 trillion won (surcharges may be subject to change depending on the final calculation of relevant turnovers)

V. Implications and Expected Effects

- An in-depth review of this case has been made through a total of seven full-commission oral hearings covering economic, legal, and patent issues since last July, including two oral hearings* for review of consent decree application.
- * Full-commission hearings for subject matters were held respectively on July 20 (First), August 17 (Second), September 5 (Third), November 9 (Fourth), and December 21 (Fifth). Qualcomm applied for a consent decree on November 18. However, the KFTC dismissed it after two review hearings held on December 5 and 14.
- This case required a traditional legal and economic analysis on the issues of the abuse of market dominance as well as a review of high-level issues such as patent issues, analysis of telecommunications technologies, and international comity.
- In order to secure due process (e.g., the examinee's right to defense) and sufficient discussion by involving stakeholders* in the mobile telecommunications industry across the world, the review of this case has taken 5 months.
- * Domestic ICT companies Samsung Electronics and LG Electronics as well as other ICT companies across the globe, including Apple, Intel, Nvidia, MediaTek, Huawei have directly or indirectly cooperated with the KFTC's investigation or participated in the KFTC's hearings.
- This case is meaningful in that the KFTC will be fundamentally correcting Qualcomm's business model that has been enabling Qualcomm to unreasonably maintain and expand its dominant position for a long time in the SEP licensing and modem chipset markets.
- By acquiring the legitimate right to use the patented technologies in order to manufacture, sell, and use chipsets, competing modem chipset manufacturers such as MediaTek and Intel:
 - would be able to compete with Qualcomm on the merits in a level playing field in terms of technology, price and quality.
- Also handset makers would be able to have an opportunity to negotiate FRAND licensing terms with Qualcomm on an arm's length basis without concerns about any adverse impact on the supply of Qualcomm's chipsets.
- The KFTC's remedies are measures to change the "closed ecosystem" where Qualcomm has benefitted exclusively into an "open ecosystem" where any

market participant can benefit from its own innovation. Such measures are anticipated to:

- Restore competition for innovation in the mobile telecommunications industry through fair compensation to handset manufacturers and chipset manufacturers for their R&D achievements; and
- Rectify not only the unlawful conduct that has been restricting competition in the product market through licensing agreements which violate the FRAND commitment but also the conduct that has enabled Qualcomm to exclusively exploit the benefits from the SEP adoption by standardization organizations in the SEP licensing market.

□ The KFTC will actively continue its enforcement efforts against conducts unfairly restricting competition or harm consumer welfare, such as abusive conducts by SEP holders, while encouraging the legitimate exercise of the intellectual property rights.

<ANNEX 1> Progress of Case Investigation and Deliberation at Hearing

<ANNEX 2> Explanation on Standard Technologies, Standard Setting Organizations and FRAND commitments

<ANNEX 3> Explanation on Standard Technologies for Mobile Communications Standard, Modem Chipsets and Internal Structure of Handset

<ANNEX 4> Penalty Surcharges Imposed on the KFTC's Major Cases

<ANNEX 5> Major Competition Authorities' Investigation on Qualcomm's Anticompetitive Practices

ANNEX 1 Progress of Case Investigation and Deliberation at Hearing

- **(Commencement of Investigation)** Through public meetings with media and industry players, the KFTC recognized the allegation that Qualcomm had been restricting competition by abusing its dominance in the wireless communications SEP and modem chipset markets and launched its own investigation. (From August 2014)
- The KFTC issued a Request for Information (RFI) to Qualcomm in order to identify underlying facts including refusal or restriction to license to modem chipset makers and free cross-grants, etc. (Aug. 2014)
- For an effective and well-structured investigation, the KFTC commenced its investigation by establishing an ICT Team in February 2015.
 - Carried out an on-site investigation of Qualcomm Korea (from March 16 to March 18) and secured electronic data evidence which amounted to eight hard disks through a digital forensic investigation.
 - Strengthened its reasoning by conducting a written survey of and interviews with domestic and foreign stakeholders such as Samsung Electronics, LG Electronics, Intel, Apple and Huawei.
- With the completion of the investigation by the examiners, an Examination Report was sent to Qualcomm on November 13, 2015.
 - For the case, tens of thousands of pages of relevant documents and thousands of pages of opinions and legal reviews were analyzed for the case. The Examination Report is as long as 400 pages (more than 3,200 pages with annexes).
 - Qualcomm postponed the deadline for the submission of opinion three times and the submission was finally made in late May of 2015. (May 27, 2016)
- **(Case Deliberation)** For deliberation of the case, a total of seven hearings presided by the full-commission including five full-commission hearings for deliberation of the case and two hearings for review of Qualcomm's application for a consent decree were held from July 2015.
- This case is distinguished from other cases in terms of the number of the full-commission hearings. Full-commission hearings were held five times, while

for other cases the full-commission hearing is usually held only one or two times. An extensive analysis was rendered by inviting comments from multiple experts in the relevant fields and from market players.

- The hearings were held to discuss each sector issue (i.e., general law, economics, patent law, patent technologies, and international comity). Domestic and foreign leading scholars having expertise in relevant fields engaged in debates representing the Examiner or Examinee's positions.
- Interested parties across the globe (e.g., Samsung Electronics, LG Electronics, Apple, Intel, NVidia, MediaTek, Huawei) directly or indirectly participated in the KFTC's investigation to explain anti-competitive impact caused by Qualcomm's business model.
- After the fourth full-commission hearing, Qualcomm applied for a consent decree. However, the KFTC finally dismissed it after two full-commission hearings.
- * Qualcomm's application for the consent decree (November 18)⇒ Examiner's Report on the consent decree was issued (November 24)⇒ Full-commission hearing was held to review the application (December 5)⇒ Qualcomm proposed additional rectification plans and the full-commission hearing resumed (December 14)⇒ The application was dismissed.

<Major Experts for the Examiner>

	Field of Expertise	Affiliation	Name
For Examiner	Competition Law	Myung Ji Univ. College of Law	Prof. Myung Su Hong
	Economics	Sung Sin Univ. Econ. Dept. Ewha Univ. Econ. Dept.	Prof. Yang Su Jin Prof. Se Hoon Bang
	Patent Law	Sungkyunkwan Univ. Law School	Prof. Cha Ho Chung
		Seoul Nat'l Univ. Law School	Prof. Young Taek Sim
		KAIST MIP Adjunct Professor	Prof. Jung Joong Kim
		E-Sang Patent Law Firm	Jae Kwan Lee (Patent Lawyer)
	Mobile Communications Technologies	Inha Univ. Electronic Engineering Dept.	Prof. Kyung Hee Chang
		Kwangwoon Univ. Electronic Engineering Dept.	Prof. Hyuk Jun Oh

<Major Experts for Qualcomm>

	Field of Expertise	Affiliation	Name
For Qualcomm	Patent Law	Han Nam Univ. College of Law	Prof. Kwan Sik Kim
		George Wash. Univ. Law School	Prof. John Whealan
	Economics	Seoul Nat'l Univ. Econ. Dept.	Prof. In Ho Lee
		Kook Min Univ. Econ. Dept.	Prof. Jong Min Kim
		Univ. of Penn. Econ. Dept. Former Assistant Sec. of U.S. Dept. of Justice	Aviv Nevo
		Linley Group Senior Analyst	Linley Gwennap
	Patented Technologies	Former Ericsson IP and licensing Director	Eric Stasik
		KIST Electrical and Engineering Dept.	Prof. Hwan Soo Lee
		Sang Myung Univ. Information and Communication Engineering Dept.	Prof. Han Ho Wang
	International Commerce	USC School of Law	Andrew Guzman
		Univ. of Int'l Business and Economics (China)	Dong Ling

<Key Interested Parties Participating in Hearings>

	Interested parties	Experts	Business Information (As of 2015)
Modem Chipset Makers	Intel Inc.	Prof. Matthew C. Valenti (West Virginia Univ.) Richard C. Donaldson (Former Texas Instrument Senior VP)	Turnover: USD 55.4 billion Turnover solely from sales of modem chipsets: USD 600 million (1.6%, 6th)
	MediaTek Inc. *	-	Turnover: USD 6.6 billion Turnover solely from sales of modem chipsets: USD 4.1 billion (19.4%, 2nd)
Handset Makers	Samsung Electronics	Prof. Sang-Seung Yi (Seoul Nat'l Univ.)	Turnover: KRW 200 trillion (Approx. USD 166 billion) Turnover solely from sales of modem chipsets: USD 1.2 billion (5.9%, 3rd) Sales volume of Handsets: 390 million units (20.7%, 1st)
	Apple Inc. *	-	Turnover: USD 234 billion Sales volume of Handsets: 230 million units (12.3%, 2nd)

* No experts from Apple and MediaTek made presentations during the hearings. Instead the executives who were present at the hearings (or legal representatives) gave presentations based on the opinions of the employees who participated in the negotiations for license agreement with Qualcomm and outside experts.

ANNEX 2 Explanation on Standard Technologies, Standard Setting Organizations and FRAND Commitments

- A standard technology refers to a technology selected as the standard in an industry by a Standard Setting Organization (SSO) to avoid overlapping investments and facilitate development of technology in relevant areas.
- A SSO refers to an organization jointly formed by interested parties in relevant industries to voluntarily select a specific technology as an industry standard.
- The International Telecommunication Union (ITU), the Institute of Electrical and Electronics Engineers (IEEE), the European Telecommunications Standards Institute (ETSI), and the Telecommunications Industry Association (TIA) in the U.S. are some of the most representative SSOs in the mobile communications industry and the Telecommunications Technology Association of Korea (TTA) is also a SSO.

<Key Standardization areas of major Information communications SSOs>

Classification	International		(Region) Europe	U.S.	Japan	China
	ITU	ISO/IEC JTC 1				
Electrical communications	Network performance, Fees and billing, Electrical communications management, Electromagnetic protection, Outdoor installation, Cable network, TV and voice transmission, Signal method, Service quality, Next-generation	(N/A)	Connection/Device, Legal wiretapping, Power line communications, Railway communications, Next-generation communications network, Transmission, Electromagnetic effect protection, Smart transport system	Network performance/ Service quality, Network interface, Communications network management, mobile communications technology, Optical transmission, Optical fiber, Multimedia access, In-home communications demands, In-home communications cabling installation,	Next-generation network, Information transmission, Signal control, Network management, DSL, Corporate network, Next-generation home network, mobile communications network management, IP based 3G network	Network/ Switching, Transmission network (NGN), IP/Multimedia, Network management, Power line communications, Network security, Electromagnetic effect protection, Home network

	communications network, Optical transmission network, Multimedia device, Information protection and software, Mobile communications network			Telematics		
Radio wave broadcast	Spectrum management, Radio wave, Satellite service, Broadcast service, Fixed base station	-	Broadband wireless connection network, Broadcast, Mobile communications, Digital wireless communications, Fixed base station, 3G mobile communications, Disaster communications, Ground radio wave	Mobile/ Private wireless, Point-to-point communications, Satellite equipment/system, Mobile/ Private communications system, Ground mobile multimedia cast, Telematics	3G mobile communications, Frequency resources, Fixed communications, Air and ocean, Radio wave environment, Broadcast, Space communications	Wireless communications, Mobile IP
Information technology	-	Character code, Information exchange technology, Software, Card and identification, Programming language, Digital storage media, Computer graphics, Information device interconnection, Information security, Business instrument, Multimedia codification, Auto-	Information technology(ECMA), GRID, Information security, Electronic signature, Smart card, Dialogue processing/transmission	-	Media codification	-

		identification and data collection, Data management and exchange, Document processing language, User interface, Educational information technology, Biometrics				
Others	-	-	Environment, Human factors, Test methods, e-Health	e-Health		Environment Protection

* Telecommunications Technology Association of Korea, "ICT Standardization Handbook", 2008: 31

- A Standard Essential Patent (SEP) refers to a patent required to implement a standard technology, the license of which is essential for manufacturing a certain product or supplying certain services.
 - In other words, it is technically impossible to manufacture, sell or use the products that embody a standard technology without infringing on a SEP.
- The FRAND commitment refers to a pledge made by the SEP holder to guarantee the provision of license on fair, reasonable and non-discriminatory terms.
 - SSOs demand a FRAND commitment to a SEP holder before the adoption of a standard, and they generally exclude the relevant technology from the standard if the SEP holder rejects that demands.

< Implication of FRAND Commitment From Competition Law Perspective >

- ◇ The standard setting process is an act of joint agreement among enterprises to select a specific technology as standard while excluding other competing technologies from the market. Therefore, there is an inherent risk that competition may be hampered when an SEP holder abuses the patent rights.

- ◇ A FRAND commitment is a pledge by an SEP holder to license to any user of a standard technology on fair, reasonable, and non-discriminatory terms in order to eliminate such risk.
- ◇ If an SEP holder does not abide by the FRAND commitment and discriminates against or does business selectively with a counterpart, an intervention may be necessary from a competition law perspective, since the standard technology can become accessible only to the patent holder or a limited number of enterprises, thereby undermining market competition.

- Among the patents, patents not directly relevant to standard are referred to as non-SEPs to distinguish them from SEPs.
 - Non-SEPs refer to the patents that are not absolutely required to realize standard or are replaceable in the functionalities through design-around or avoidance design.
 - Therefore, unlike SEPs, non-SEPs do not have the obligations to abide by the FRAND commitment in the patent licensing process.

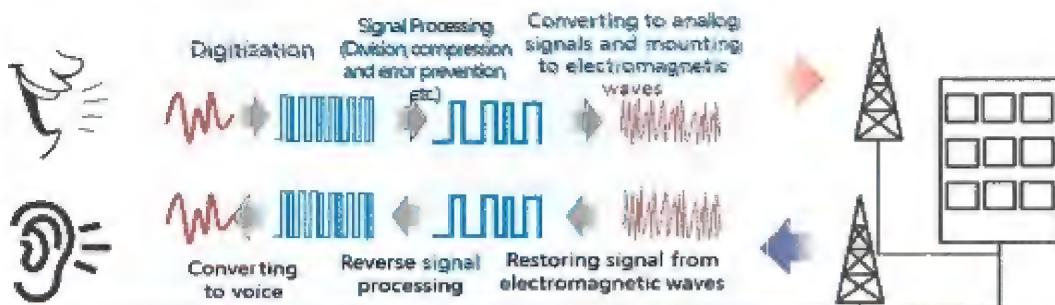
ANNEX 3

Explanation on Standard Technologies for Mobile Communications Standard, Modem Chipsets and Internal Structure of Handset

- The principle of mobile communications and the development of mobile communications standard.

The Principle of Mobile Communication

- ◆ A mobile phone processes voice and data signals according to a certain set of rules before transmitting the coded information to a nearby base station.
- ◆ The base station receives the information and sends it to another base station near the other party on the call.
- ◆ The other party's mobile phone receives the information (from the base station nearby) and decodes it into the original voice and data signals.
- ◆ A standard is necessary to ensure that mobile phones comply with the same rules in coding and decoding information.



The Development of Mobile communications Standard

- ◆ Continuous growth of data with an increasing number of mobile communications subscribers led to the development of mobile communications technologies, in order to efficiently use limited bandwidth resources while improving the speed of information processing. Mobile communications standards evolved along with the development of mobile communications technologies.

	1G	2G	3G	4G	
US, Korea, etc.	Analog Method	CDMA	CDMA2000	LTE, LTE-A	Improvement in speed
Europe, etc. (AMPS, etc.)	(AMPS, etc.)	GSM	WCDMA		

- ◆ The evolution of mobile communications does not mean an overnight migration on a large scale to a new generation of technology. Older standards must still be serviced for a certain period of time for subscribers who are using older models of mobile phones. Also, older base stations will still be in service since mobile carriers are unable to replace the entirety of their existing base stations overnight with a new generation of technology.
- ◆ Therefore, older standards such as 2G CDMA and 3G WCDMA continue to play an important role in mobile communications alongside 4G LTE, the latest standard.

□ Mobile Communications and Mobile Communications Chipsets (Modem Chipset)

The Modem Chipset is a core component in Mobile Communication

The modem chipset is a component that carries out a core function of mobile communications, namely the processing and decoding of information in accordance with mobile communications standards.

- ◆ A multi-mode chip is generally used to support both the new standard (LTE) and the old standard (CDMA, WCDMA).

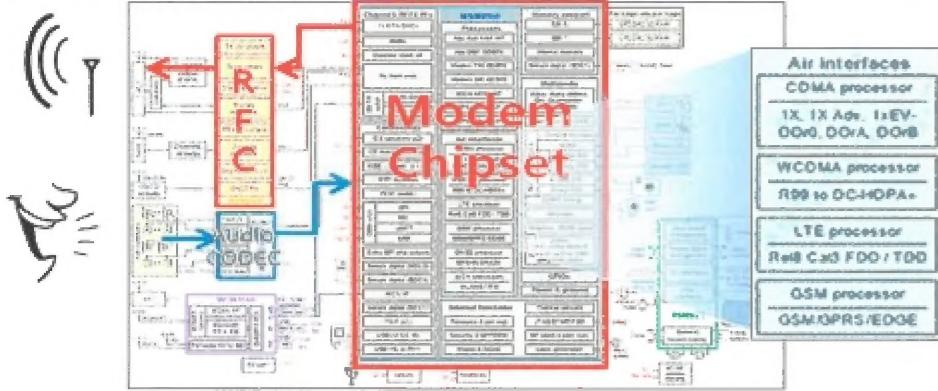


Figure 1-1 MSM8960 functional block diagram and example applications

Components inside a Mobile Phone and the Changes in the Modem Chipset

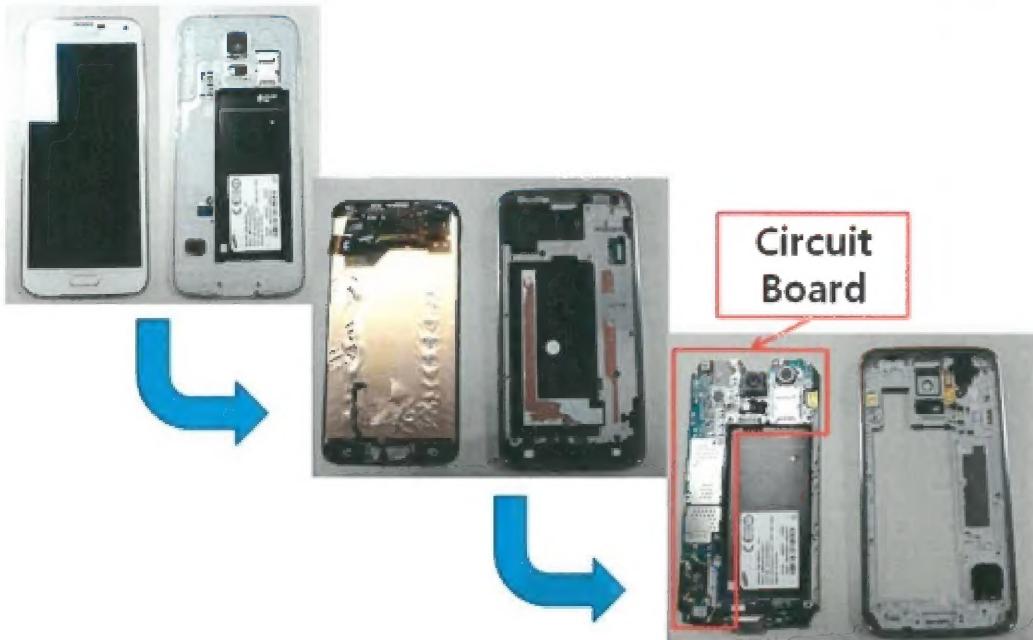
- ◆ Previous mobile phones had only basic call functionality, and therefore the modem chipset represented the core functionality of mobile communications.
- ◆ However, recent smartphones are no longer mere telephones; in fact, smartphones are now a comprehensive ICT device, with not just the modem chipset for mobile communications but a wide variety of other components to support various functionalities such as the camera, computing, and multimedia.

Composition of Smartphone

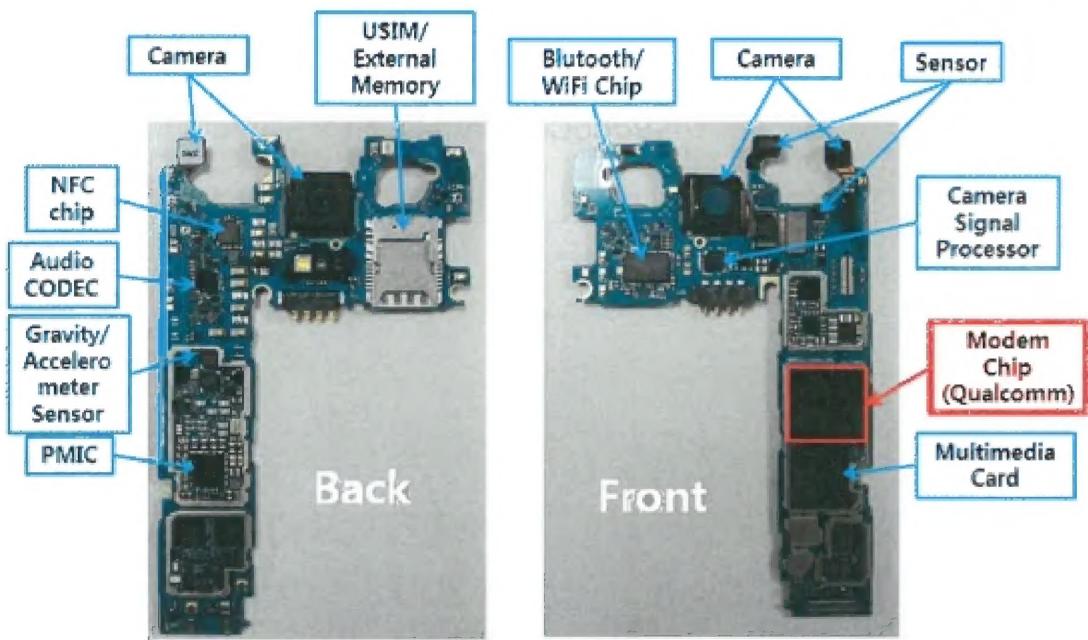


Internal Structure of Handset and Modem Chipsets

Internal Structure of Handset



Internal Structure of Handset – Main Components



ANNEX 4 Penalty Surcharges Imposed on the KFTC's Major Cases

Major cases in the KFTC's history and size of surcharges imposed

Number	Case Description	Surcharge (billion Won)	Year	Status
1	A Case on Abuse of Market Dominance by Qualcomm Incorporated	1,030	Dec. 2016	-
2	A Case on Unfair Collusion by Six LPG Suppliers	670	Apr. 2010	Partial Win
3	A Case on Unfair Collusion by 28 Construction Companies in Express Railroad Construction Bidding	348	Sep 2014	Win
4	A Case on Abuse of Market Dominance by Qualcomm Incorporated, Qualcomm Korea (Ltd.), and Qualcomm CDMA Technology Korea	273	Sep. 2012	Appeal Pending at the Supreme Court
5	A Case on Unfair Collusion by Seven Cement manufacturers.	199	Mar. 2016	Appeal Pending at the Seoul High Court

* The above amounts are based on the initial written resolutions and some have been modified in the process of objection applications and litigations.

ANNEX 5**Major Competition Authorities' Investigation on Qualcomm's Anticompetitive Practices**

- The National Development and Reform Commission of China (NDRC) ordered Qualcomm to rectify its practices which include charging handset makers excessive royalties and tie-in sales of patent. The NDRC also imposed a penalty surcharge of approximately KRW 1 trillion. (Feb. 2015)

<Comparison of measures imposed by the NDRC and KFTC>

	NDRC Remedies	KFTC Remedies
Remedies regarding modem chipset manufacturer(s)	(None)	<ul style="list-style-type: none"> ➤ At the request of a competing modem chipset manufacturer, Examinee must negotiate in good faith and is prohibited from demanding any unfairly restrictive terms when negotiating a license agreement with a competing modem chipset manufacturer,
Remedies regarding mobile phone manufacturers	<ul style="list-style-type: none"> ➤ Calculation of royalties based on 65% of the price of mobile phone ➤ A list of the relevant patents must be furnished at the time the licensing agreement is executed, and imposing royalties on expired patents is prohibited ➤ Prohibition of demanding a gratuitous cross-license ➤ Prohibition of tying mobile telecommunications SEPs to other patents 	<ul style="list-style-type: none"> ➤ Prohibition of linking patent license agreement with modem chipset purchase ➤ Upon request from mobile phone manufacturer, deletion or amendment of clause conditioning license in modem chipset supply agreement ➤ Prohibition of forcing unilaterally-determined patent licensing terms upon counterparty <ul style="list-style-type: none"> - Comprehensive license - Cross-grant free of charge - Forced unilateral licensing terms without any process of determining fair compensation due to counterparty ➤ Upon request from mobile phone manufacturer, must engage in renegotiation of license agreement

- The Japan Fair Trade Commission ordered Qualcomm to rectify its practice of requesting free cross-grants from handset makers. (Sept. 2009, an objection process is underway)
- The Federal Trade Commission and Taiwan Fair Trade Commission are currently investigating Qualcomm's patent abuse.
- The EU is conducting an investigation on Qualcomm's practices including the provision of conditional rebates and exclusion of competing enterprises by setting the chipset price to be lower than the production cost.